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MICHAEL N. HAYNES 1341 HUNTERSFIELD CLOSE KESWICK, VA 22947			EXAMINER LIGHTFOOT, ELENA TSOY	
			ART UNIT	PAPER NUMBER
			1792	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,966

Applicant(s)

GUILLET ET AL.

Examiner

Elena Tsoy Lightfoot

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 15-17, 67-72, 74-76 and 82-88 is/are pending in the application.
- 4a) Of the above claim(s) 1, 15-17, 67, 68, 70 and 83-88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 69, 71, 72, 74-76 and 82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/06, 12/07, 5/08, 7/08, 3/09
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Amendment

Amendment filed on January 22, 2009 has been entered. Claims 1, 15-17, 67-72, 74-76, 82-88 are pending in the application.

Election/Restrictions

1. Applicant's election with traverse of species 69 and 71-82 of Group II, in the reply filed on 1/22/2009 is acknowledged.

Applicants traverse the restriction again on the ground the Applicants' specification recites Blum in P37 among references showing crosslinked and uncrosslinked polymer particles of P36.

The Examiner respectfully disagrees with this argument. First of all, as stated by the Examiner in Office Action mailed on 6/12/2008, Blum discloses *explicitly* crosslinked particles (See column 10, lines 39, and 54-56). Second, according to Applicants' own logic, **some** references (even if it is not Blum) recited in P37 do show claimed crosslinked particles. Third, what about the fact that a hydrolyzed fibrous protein selected from the group consisting of hydrolyzed *fibronectin* and hydrolyzed *elastin* recited in P38 of Published Application, which (i.e. hydrolyzed fibrous protein selected from the group consisting of hydrolyzed *fibronectin* and hydrolyzed *elastin*) is also disclosed by Blum '562 (See column 3, lines 44-52)?

The requirement is still deemed proper and is therefore made FINAL.

Traversal of Species

Applicants assert that Species i, claims 69, and 71-82 are elected with traverse, because no reasonable showing of a lack of unity of invention between the claims of alleged Species i, ii, and iii has been presented. In fact, the present Restriction Requirement openly admits that these alleged Species are directed to a "generic invention". Thus, these alleged Species logically must be "linked as to form a single general inventive concept". Moreover, there are certainly corresponding special technical features between each of the claims of the alleged Species. For

example, each of claims 69-85 recites "a dispersion of solid particles comprising an internally crosslinked polymer comprising at least one hydrophobic substituent and at least one hydrophilic substituent". Consequently, Applicant respectfully submits that the Restriction Requirement is improper and respectfully requests withdrawal thereof.

The Examiner respectfully disagrees with this argument an internally crosslinked polymer comprising at least one hydrophobic substituent and at least one hydrophilic substituent (a corresponding special technical features between each of the claims of Species) is known in the art. Thus, these Species are not linked as to form a single general inventive concept.

The requirement is still deemed proper and is therefore made FINAL.

Status of Claims

Claims 1, 15-17, 67-72, 74-76, 82-88 are pending in the application. Claims 1, 15-17, 67-68, 70, 83-88 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention and species.

Abstract

2. Applicant is reminded of the proper content of an Abstract of the Disclosure.

In chemical patent abstracts for compounds or compositions, the general nature of the compound or composition should be given as well as its use, *e.g.*, "The compounds are of the class of alkyl benzene sulfonyl ureas, useful as oral anti-diabetics." Exemplification of a species could be illustrative of members of the class. For processes, the type reaction, reagents and process conditions should be stated, generally illustrated by a single example unless variations are necessary.

Complete revision of the content of the abstract is required on a separate sheet.

3. The Abstract appears to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

For example, “Certain exemplary embodiments can provide a composition comprising water droplets comprising a dispersion of particles comprising a polymer comprising at least one hydrophobic substituent and at least one hydrophilic substituent”; “The polymer can be formed **from** polymerization and/or copolymerization”.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 69 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for solid particles being less than 1000 **nanometers**, does not reasonably provide enablement for up to 1000 **microns** as claimed in 76. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The Applicants’ specification describes that “The thickness of the polymer layer coating the water droplets may range from about 100 microns to about **500 microns**, including all values therebetween” (See P23 of Published Application) and “Each of the particles can have a molecular weight of from about five hundred thousand (**500,000**) to about **fifty million (50,000,000)**, including all values therebetween and all subranges therebetween. Each particle can be a *nanoparticle*, which as used herein, means a solid particle with an average major diameter of from about **2 nanometers to about 1000 nanometers**, including all values therebetween” (See P42 of Published Application). Thus, considering the Applicants’ specification *on the whole*, solid particles are

Art Unit: 1792

defined to be *nanoparticles* with an average major diameter of from about 2 **nanometers** to about 1000 **nanometers** not from about 2 **microns** to about 1000 **microns** as claimed in 76.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 69, 71-72, 74-76, and 82 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 69, line 1, “an aqueous **solution** comprising a **dispersion** of solid particles”, which renders the claim indefinite because it is not clear what is claimed a “solution” or “dispersion”? For examining purposes the phrase was interpreted as “an aqueous ~~solution comprising a~~ **dispersion** of solid particles” or “an aqueous colloidal solution comprising ~~a dispersion of solid~~ nanoparticles” since it is well known in the art that a dispersion of colloidal particles may be called “solution”.

Claim 76 recites “the particles have an average diameter of from about 2 microns to about 1000 microns” which contradicts claim 69 because particle of 1000 **microns** generally cannot form a (colloidal) “solution” as claimed in claim 69. For examining purposes the phrase was interpreted as “the particles have an average diameter of from about 2 ~~microns~~ nanometers to about 1000 ~~microns~~ nanometers”.

8. Claim 71 recites the limitation “the copolymer” in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 69, 72, 74, 82 are rejected under 35 U.S.C. 102(b) as being anticipated by Stewart et al (US 6,199,318).

Stewart et al discloses an aqueous, non-phytotoxic latex (See column 10, lines 64-65) composition comprising crystalline polymeric particles suspended in water (See column 2, lines 6-10). Preferably the particles comprise the crosslinked polymeric reaction product of a monomer component comprising (i) a *hydrophobic* monomer component, (ii) a *hydrophilic* monomer component, and (iii) a sufficient amount of at least one *crosslinking* monomer having at least two polymerizable groups that the polymeric reaction product has a gel content of at least 50% (See column 2, lines 26-33). Thus, the particles are crosslinked *internally*, as required by Claim 69.

As to claim 72, Preferably the hydrophilic monomer is selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid or 2-acrylamido-2-methylpropane sulfonic acid,

acrylamide, methacrylamide, hydroxyethyl (meth)acrylate and mixtures thereof (claimed water-soluble monomers) (See column 7, lines 35-39).

As to claim 74, The formed latex compositions have a specific particle size distribution with the mean volume diameter of the particles in the range of **0.1 to 0.5 microns**, preferably in the range of 0.25 to 0.35 microns, by the light scattering technique. Small particles are desirable to avoid clogging of spray nozzles when the latex is applied by spraying. (See column 13, lines 4-9).

12. Claims 69, 71, 72, 74-76, and 82 are rejected under 35 U.S.C. 102(b) as being anticipated by Savignano et al (US 5,653,054).

Savignano et al discloses an *aqueous* composition comprising a freezing point depressant such as propylene glycol (See column 2, lines 57-60) and a thickening agent such as crosslinked copolymers (See column 3, lines 26-31) of acrylic acid having a molecular weight in the range of about **750,000 to about 4,000,000** as (See column 3, lines 15-18). These polymers are prepared by polymerizing a mixture of acrylic acid (claimed hydrophilic water soluble monomer) and up to about 35 wt % of a copolymerizable monomer, e.g., an alkyl acrylate or methacrylate (claimed hydrophobic substituent), in the presence of a *crosslinking agent* having two or more $\text{CH}_2=\text{C}<$ groups per molecule, e.g., divinyl benzene or butadiene (See column 3, lines 18-25). Thus, the particles are crosslinked *internally*, as required by Claim 69.

As to claim 76, Although Savignano et al does not expressly teach the size of the particles. However, one of ordinary skill in the art would easily recognize that the particle size of the internally crosslinked polymer depends on molecular weight of a polymer. Since the

molecular weight of 750,000 to about 4,000,000 in Savignano et al is within claimed range, the size of the particles would also be within claimed range of 2-1000 nm.

13. Claims 69, 71, 72, 74-76 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum (US 6,180,562) in view of Savignano et al (US 5,653,054).

Blum describes an aqueous composition comprising solid particles of a crosslinked polymer (See column 10, lines 54-56) or a polymer having a relatively low amount of crosslinking (i.e. being internally crosslinked) (See column 10, lines 37-42) for application to the surfaces of plants for protecting the plants from damage caused by frost and/or freeze (See column 1, lines 10-12). The composition may further comprises freezing point depressants, such as monohydric alcohols, small chain dihydroxy and polyhydroxy alcohols, such as propylene glycol (See column 9, lines 20-26).

Blum does not disclose that the crosslinked polymer is internally crosslinked polymer comprising at least one hydrophobic substituent and at least one hydrophilic substituent (Claim 69).

However, Blum teaches in the BACKGROUND OF THE INVENTION that a composition for preventing or retarding frost formation on grass or leafy plants comprising a mixture of water, a water-soluble freezing point depressant such as propylene glycol, and a water dispersible thickening agent such as a cross-linked polyacrylic acid polymer was known in the art and described, for example by U.S. Pat. No. 5,653,054 to Savignano et al (See column 2, lines 8-20). Savignano et al '054 teaches that the crosslinked polyacrylic acid polymer (See column 3, lines 26-31) having a molecular weight in the range of about 750,000 to about 4,000,000 as (See column 3, lines 15-18) is prepared by polymerizing a mixture of acrylic acid

(claimed hydrophilic **water soluble monomer**) and up to about 35 wt % of a copolymerizable monomer, e.g., an alkyl acrylate or methacrylate (claimed hydrophobic substituent), in the presence of a *crosslinking agent* having two or more $\text{CH}_2=\text{C}<$ groups per molecule, e.g., divinyl benzene or butadiene (See column 3, lines 18-25). Thus, the particles are crosslinked *internally*, as required by Claim 69.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a cross-linked polyacrylic acid polymer of Savignano et al in Blum as the crosslinked polymer with the expectation of providing the desired preventing or retarding frost formation on grass or leafy plants since Blum does not limit its teaching to particular crosslinked polymers, and Savignano et al teaches that the crosslinked polyacrylic acid polymer is suitable for the use in plant protecting compositions.

As to claim 71, Blum teaches that heat is released over a temperature range because the polymers in the compositions exhibit a broad freezing transition range beginning at about 32° , preferably in a range of from **at least about 32°F** to about 27°F or lower which enables the polymers to release their latent heat of fusion over a broad temperature range (See column 4, lines 21-30).

It is the Examiner's position that "**at least about 32°F** " covers claimed 40°F .

14. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blum '562 in view of Savignano et al '054, as applied above, and further in view of Haruta et al (US 4,975,375).

Blum '562 teaches that heat is released over a temperature range because the polymers in the compositions exhibit a broad freezing transition range beginning at about 32° , preferably in a

range of from **at least about 32°F** to about 27°F or lower which enables the polymers to release their latent heat of fusion over a broad temperature range (See column 4, lines 21-30).

Blum '562 in view of Savignano et al '054 does not disclose that the polymer releases heat over a range of dropping ambient temperatures beginning at about 40°F.

However, Haruta et al teaches that in order to obtain a polymer gel having a *phase transition temperature* which falls in a **preferable range**, the raw materials (e.g. a linear polymer and a crosslinking agent) need be selected carefully because when, for example, an N-substituted acrylamide is used as a monomer for a linear polymer, use of an acrylamide having a **hydrophobic** N-substituent tends to give a **low** phase transition temperature of the polymer gel obtained and, in contrast, use of an acrylamide having a **hydrophilic** N-substituent tends to give a **high** phase transition temperature and also because a **higher crosslink density** will result in a higher phase transition temperature of the gel (See column 6, lines 30-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed a crosslinked polymer in Blum '562 in view of Savignano et al '054 to have predetermined phase transition temperature (including those of claimed invention) in Blum '562 in view of Savignano et al '054 through routine experimentation depending on particular use of a final product in the absence of showing of criticality.

15. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savignano et al '054.

Savignano et al further teaches that the **degree of frost protection** and the viscosity of the thickened or gelled composition will vary as a *function of the amounts* of freezing point depressant and thickening agent respectively present in the composition (See column 4, lines 21-

24). For example, compositions containing as little as about 5 wt % propylene glycol and 0.05 to 0.1 wt % of the thickener applied without dilution to grass will provide a coating which has a freezing point of about 30°F and which adheres to the surfaces of the grass blades with minimal run off. Table 1 illustrates the approximate protection temperatures for formulations containing various quantities of propylene glycol mixed with water. (See column 4, lines 21-33). In the preferred embodiment, the frost protection composition is provided as a concentrate adapted to be diluted with water by the consumer prior to use. The amount of water added by the consumer will vary as a function of the degree of frost protection desired which will in turn be dictated by the severity of any overnight frost which is expected (See column 4, lines 47-51). For example, a concentrate containing equal parts by weight propylene glycol and water could be diluted with 9 volumes of water per 1 volume of concentrate to provide light frost or 30°F protection as shown in Table 1. The same concentrate could also be diluted with as little as 2 volumes of water per one volume of concentrate to provide heavier frost protection, or 24°F protection as also shown in Table 1. Thus, the degree of desired protection based on anticipated frost conditions will vary as a function of the extent of water dilution of the concentrate prior to application to the surfaces to be protected. See column 4, lines 45-62.

It is common knowledge that upon freezing water *associated with polymers releases* latent **heat** of fusion (as shown by Blum above).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant amount of water parameters in Savignano et al through routine experimentation depending the degree of frost

protection desired (including those of claimed invention) in the absence of showing of criticality.

16. Claims 75-76 and 82 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Stewart et al '318.

As to claim 75, Stewart et al '318, as applied above, does not teach molecular weight of the particles. However, one of ordinary skill in the art would easily recognize that the particle size of the internally crosslinked particles would depend on molecular weight of polymer. Since the size of the particles in Stewart et al '318 is **0.1 to 0.5 microns**, i.e. within claimed range is from, the molecular weight of the particles would also be within claimed range.

As to claim 76, note that the size of the particles of **0.1-0.5 microns** in Stewart et al '318 is within claimed range.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy Lightfoot whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Friday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/529,966

Page 13

Art Unit: 1792

Elena Tsoy Lightfoot, Ph.D.

Primary Examiner

Art Unit 1792

March 24, 2009

/Elena Tsoy Lightfoot/